AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) An electronic component cooling apparatus comprising:

a heat sink having an electronic component mounting surface on which an electronic component to be cooled is mounted and a coolant path with a coolant inlet and a coolant outlet through which a liquid flows as a coolant to forcibly cool the electronic component mounting surface;

a radiator having a liquid path with a coolant inlet and a coolant outlet through which the coolant flows and adapted to air-cool the liquid path to cool the coolant;

a motor-driven fan mounted at a heat dissipating portion of the radiator to supply cooling air to the radiator;

a first coolant path connecting the coolant outlet of the heat sink to the coolant inlet of the radiator;

a second coolant path connecting the coolant outlet of the radiator to the coolant inlet of the heat sink; and

a motor-driven pump installed in the first coolant path or the second coolant path to give a moving energy to the coolant:

wherein the motor-driven fan includes:

an air channel body having a suction port at one end thereof facing a front of the heat dissipating portion of the radiator and a discharge port at the other end thereof;

an impeller having a plurality of blades, at least a part of the impeller being arranged inside the air channel body, said plurality of blades each have an edge facing the front of the heat dissipating portion, each of the edges sloping gradually away from the heat dissipating portion as each of the edges extends in a radially outward direction from a rotating center of the impeller;

a motor for rotating the impeller so as to draw in air through the suction port and discharge air from the discharge port; and a plurality of engaging pieces integrally provided at the air channel body; and

wherein the radiator has a plurality of engaged portions with which the plurality of the engaging pieces engage.

2. (Cancelled)

3. (Original) The electronic component cooling apparatus as defined in claim 1, wherein a plurality of webs connecting a housing of the motor and an end portion of the air channel body on the side of the discharge port are situated outside the discharge port or the end portion on the side of the discharge port is lower than an uppermost surface of the housing of the motor.

4. (Currently Amended) An electronic component cooling apparatus comprising:

a heat sink having an electronic component mounting surface on which an electronic component to be cooled is mounted and a coolant path with a coolant inlet and a coolant outlet through which a liquid flows as a coolant to forcibly cool the electronic component mounting surface;

a radiator having a liquid path with a coolant inlet and a coolant outlet through which the coolant flows and adapted to air-cool the liquid path to cool the coolant;

a motor-driven fan mounted at a heat dissipating portion of the radiator to supply cooling air to the radiator;

a first coolant path connecting the coolant outlet of the heat sink to the coolant inlet of the radiator;

a second coolant path connecting the coolant outlet of the radiator to the coolant inlet of the heat sink; and

a motor-driven pump installed in the first coolant path or the second coolant path to give a moving energy to the coolant:

wherein the heat sink has a base plate which has the electronic component mounting surface and a heat dissipating surface, the heat dissipating surface being opposite to the electronic component mounting surface in a thickness direction of the base plate and in direct contact with the coolant, the heat dissipating surface being so shaped as to have at least one pair of sides facing each other;

wherein the heat sink has the coolant inlet and the coolant outlet so that the coolant can flow from one of the sides of the heat dissipating surface to the other side of the heat dissipating surface; and

wherein the base plate is so shaped in a transverse cross section as to form ~~a~~ one resistance increasing portion between the one side and the other side of the

heat dissipating surface for increasing a resistance against a flow of the coolant, said one resistance increasing portion ~~being a raised portion that is formed by increasing a thickness of the base plate from the one side and the other side of the heat dissipating surface toward a center of the heat dissipating surface~~consisting of first to third portions, wherein:

the first portion being formed as an inclined surface that goes up from the one side such that the thickness of the resistance increasing portion gradually increases;

the second portion following the inclined surface and being formed as a non-inclined surface that extends so that the thickness of the resistance increasing portion is constant; and,

the third portion following the non-inclined surface and being formed as another inclined surface that goes down toward the other side such that the thickness of the resistance increasing portion gradually decreases.

5. (Cancelled)

6. (Previously Presented) The electronic component cooling apparatus as defined in claim 4, wherein the heat dissipating surface has a plurality of radiation fins formed integrally therewith, and

the plurality of radiation fins each extend in a first direction from the one side to the other side and are arranged along the heat dissipating surface at predetermined intervals in a second direction perpendicular to the first direction.

7. (Original) The electronic component cooling apparatus as defined in claim 6, wherein the heat sink has a top plate facing the base plate with a predetermined space therebetween and a peripheral wall portion connecting the base plate and the top plate,

the coolant inlet and the coolant outlet are so formed near the one side and the other side respectively as to pierce through the top plate in a thickness direction thereof, and

positions of both end portions, with respect to the first direction, of the plurality of radiation fins are so determined that flow speeds of the coolant do not vary excessively greatly among flow passages each formed between two adjacent radiation fins as the coolant flows in at the coolant inlet and flows out of the coolant outlet through the flow passages.

Claims 8-21 (Cancelled)